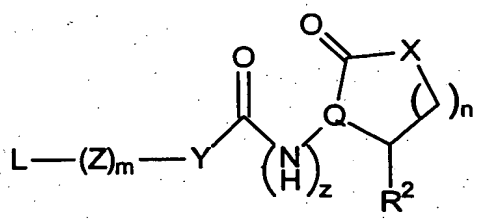
WHAT IS CLAIMED IS:

1. An immunogenic conjugate comprising a carrier molecule covalently conjugated or otherwise bound to an autoinducer of a Gram negative bacteria of a compound of Formula (I):

(I)



where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2C1, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl.

2. An immunogenic conjugate according to claim 1, wherein said carrier molecule comprises a lysine-containing protein.

3. An immunogenic conjugate according to claim 2, wherein said lysine-containing protein is selected from the group consisting of bovine serum albumin, chicken egg ovalbumin, keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid, and thyroglobulin.

4. An immunogenic conjugate according to claim 1, wherein said autoinducer is produced by a Gram negative bacteria comprising *Aeromonas hydrophila, Agrobacterium tumefaciens, Burkholderia cepacia, Chromobacterium violaceum, Enterobacter agglomerans, Erwinia stewarti, Erwinia carotovora, Escherichia coli, Nitrosomas europea,*

Photobacterium fischeri, Pseudomonas aeruginosa, Pseudomonas aureofaciens, Rhizobium leguminosarum, Serratia liquefaciens, or *Vibrio harveyi*.

5. An immunogenic conjugate according to claim 1, wherein said autoinducer comprises N-(3-oxododecanoyl)-L-homoserine lactone, N-(butanoyl)-L-homoserine lactone, N-hexanoyl-homoserine lactone, N-(3-oxohexanoyl)-homoserine lactone, N-β (hydroxybutyryl)-homoserine lactone, N-(3-oxooctanoyl)-L-homoserine lactone, or N-(3R-hydroxy-cis-tetradecanoyl)-L-homoserine lactone.

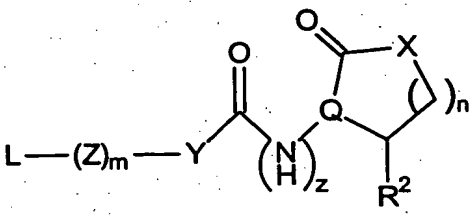
6. The immunogenic conjugate of claim 6 in which the autoinducer is N-(3-oxododecanoyl)-L-homoserine lactone or N-(butanoyl)-L-homoserine lactone.

7. An immunogenic conjugate of claim 1, wherein said carrier molecule has at least one amine group, said autoinducer has an N-acyl homoserine lactone structure, and said conjugate is the reductive amination product of said carrier molecule and said autoinducer.

8. An isolated antibody or fragment thereof which specifically binds an autoinducer of or produced by a Gram negative bacteria.

9. The isolated antibody or fragment thereof of claim 8 in which the autoinducer is a compound of Formula (I):

(I)



where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2C1, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or

1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl.

10. The isolated antibody or fragment thereof of claim 8 which is a monoclonal antibody.

11. The isolated antibody or fragment thereof of claim 8 in which the autoinducer comprises N-(3-oxododecanoyl)-L-homoserine lactone, N-(butanoyl)-L-homoserine lactone, N-hexanoyl-homoserine lactone, N-(3-oxohexanoyl)-homoserine lactone, N-β (hydroxybutyryl)-homoserine lactone, N-(3-oxooctanoyl)-L-homoserine lactone, or N-(3R-hydroxy-cis-tetradecanoyl)-L-homoserine lactone.

12. The isolated antibody or fragment thereof of claim 11 in which the autoinducer is N-(3-oxododecanoyl)-L-homoserine lactone or N-(butanoyl)-L-homoserine lactone.

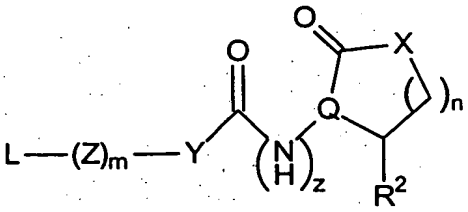
13. The isolated antibody or fragment thereof of claim 8 in which the autoinducer is covalently conjugated or otherwise bound to a carrier molecule.

14. The isolated antibody or fragment thereof of claim 13 in which the carrier molecule is selected from the group consisting of bovine serum albumin, chicken egg ovalbumin, keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid, and thyroglobulin.

15. The isolated antibody or fragment thereof of claim 8 in which the autoinducer is produced by a Gram negative bacteria comprising *Aeromonas hydrophila, Agrobacterium tumefaciens, Burkholderia cepacia, Chromobacterium violaceum, Enterobacter agglomerans, Erwinia stewarti, Erwinia carotovora, Escherichia coli, Nitrosomas europea, Photobacterium fischeri, Pseudomonas aeruginosa, Pseudomonas aureofaciens, Rhizobium leguminosarum, Serratia liquefaciens*, or *Vibrio harveyi.*

16. A method for detecting a Gram negative bacteria autoinducer in a sample comprising adding to the sample an antibody in which the antibody specifically binds the autoinducer of a Gram negative bacteria of a compound of Formula (I):

(I)

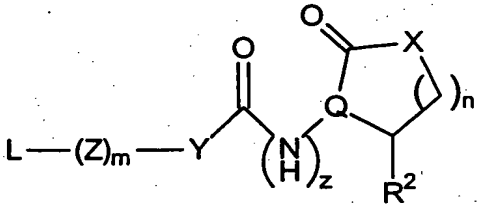


where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2Cl, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl.

17. The method according to claim 16 wherein the autoinducer is produced by a Gram negative bacteria comprising *Aeromonas hydrophila, Agrobacterium tuinetaciens, Burkholderia cepacia, Chromobacterium violaceum, Enterobacter agglomerans, Erwinia stewarti, Erwinia carotovora, Escherichia coli, Nitrosomas europea, Photobacterium fischeri, Pseudomonas aeruginosa, Pseudomonas aureofaciens, Rhizobium leguminosarum, Serratia liquefaciens*, or *Vibrio harveyi*.

18. A method of treating or preventing an infectious disease in a subject comprising administering an amount of an immunogenic conjugate in which the immunogenic conjugate comprises a carrier molecule covalently conjugated or otherwise bound to an autoinducer of a Gram negative bacteria of a compound of Formula (I):

(I)



where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2Cl, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl, in which said amount is effective to treat or prevent said infectious disease.

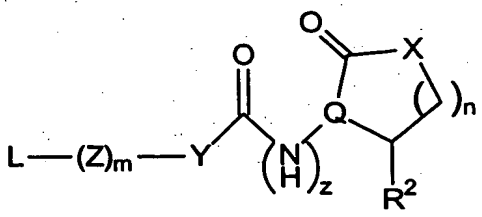
19. The method according to claim 18 wherein said immunogenic conjugate is administered orally, intradermally, intramuscularly, intraperitoneally, intravenously, subcutaneous, or intranasally.

20. The method according to claim 18 wherein said subject is a human.

21. The method of claim 18 in which the infectious disease is caused by a Gram negative bacteria.

22. A method of treating or preventing an infectious disease in a subject comprising administering an amount of an antibody or fragment thereof which specifically binds an autoinducer of a Gram negative bacteria of a compound of Formula (I):

(I)



where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched

alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2Cl, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl, in which said amount is effective to treat or prevent said infectious disease.

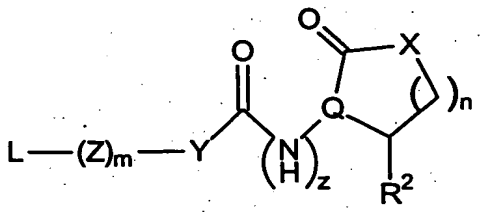
23. The method according to claim 22 wherein said subject is a human.

24. The method according to claim 22 wherein said antibody is administered orally, intradermally, intramuscularly, intraperitoneally, intravenously, subcutaneously, or intranasally.

25. The method of claim 22 in which the infectious disease is caused by a Gram negative bacteria.

26. A diagnostic kit comprising an antibody which specifically binds an autoinducer of a Gram negative bacteria of a compound of Formula (I):

(I)



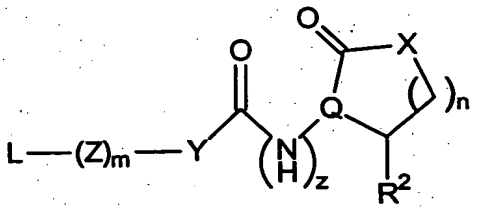
where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2Cl, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or

C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl.

27. A pharmaceutical composition comprising an antibody or fragment thereof which specifically binds an autoinducer produced by a Gram negative bacteria; and a pharmaceutically acceptable carrier.

28. The pharmaceutical composition of claim 27 in which the autoinducer is a compound of Formula (I):

(I)



where X is O, S, N-(C_1—C_6) alkyl, NR^2, N-phenyl; Y is C_1—C_6 straight or branched alkyl, C_1—C_6 straight or branched alkenyl, C_1—C_6 straight or branched alkynyl; Z is C=O, C=S, CHOH, C=N-NR^1, C=N-OH, C_1—C_8 straight or branched alkyl, C_1—C_8 straight or branched alkenyl, C_1—C_8 straight or branched alkynyl; L is C_1—C_{18} straight or branched alkyl, C_1—C_{18} straight or branched alkenyl, C_1—C_{18} straight branched alkynyl, or —CO_2H, —CO_2R^1, —CHO, —C≡N, —N=C=O, —N=C=S, OH, OR^1, —CH=CH—CH_2Br, —CH=CH—CH_2Cl, —SAc or SH, where R^1 is C_1—C_6 straight or branched alkyl, m is 0 or 1; z is 0 or 1; R^2 is H, C_1-C_6 straight or branched alkyl, C_1-C_6 straight or branched alkenyl or C_1-C_6 straight or branched alkynyl, or CO_2H; and Q is CH or N; and n is 0-3 with the proviso that when n is 0, X is N—(C_1—C_6 alkyl) or N-phenyl; and a pharmaceutically acceptable carrier.

29. The pharmaceutical composition of claim 27 which the antibody is a monoclonal antibody.

30. The pharmaceutical composition of claim 27 in which the autoinducer comprises N-(3-oxododecanoyl)-L-homoserine lactone, N-(butanoyl)-L-homoserine lactone, N-hexanoyl-homoserine lactone, N-(3-oxohexanoyl)-homoserine lactone, N-β (hydroxybutyryl)-homoserine lactone, N-(3-oxooctanoyl)-L-homoserine lactone, or N-(3R-hydroxy-cis-tetradecanoyl)-L-homoserine lactone.

31. The pharmaceutical composition of claim 27 in which the autoinducer is N-(3-oxododecanoyl)-L-homoserine lactone or N-(butanoyl)-L-homoserine lactone.

32. The pharmaceutical composition of claim 27 in which the autoinducer is covalently conjugated or otherwise bound to a carrier molecule.

33. The pharmaceutical composition of claim 32 in which the carrier molecule is selected from the group consisting of bovine serum albumin, chicken egg ovalbumin, keyhole limpet hemocyanin, tetanus toxoid, diphtheria toxoid, and thyroglobulin.

34. The pharmaceutical composition of claim 27 in which the autoinducer is produced by a Gram negative bacteria comprising *Aeromonas hydrophila, Agrobacterium tumefaciens, Burkholderia cepacia, Chromobacterium violaceum, Enterobacter agglomerans, Erwinia stewarti, Erwinia carotovora, Escherichia coli, Nitrosomas europea, Photobacterium fischeri, Pseudomonas aeruginosa, Pseudomonas aureofaciens, Rhizobium leguminosarum, Serratia liquefaciens*, or *Vibrio harveyi*.